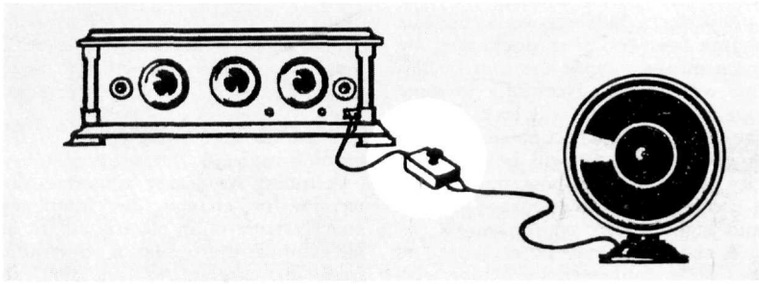
SPRAGUE®
THE MARK OF RELIABILITY

LOG

40 1926 1966 Anniversary
SPRAGUE ELECTRIC COMPANY

JUNE-JULY 1966

Then . . . 1926



A New Product For A New Industry Was The Beginning of Sprague Electric Co.

What is it that prompts the birth of a manufacturing company? There are many answers, but basically it is a product which someone feels has wide enough interest to be purchased in the marketplace.

In 1925 radio was a relatively new medium. Families purchasing their first radio were more thrilled with the new "gadget" than today's purchasers of large colored TV sets. Reception was poor by today's standards, but men of vision were considering the problem a challenge.

Robert C. Sprague, then a young naval lieutenant stationed in Quincy, Massachusetts, had an idea to improve the tone of his radio set. In his home workshop he developed a tapped, fixed paper condenser, with an accompanying switch, which made seven different capacity values available to the operator. By adding the proper capacity value across the output of the radio and the input of the separate speaker then in use, a pleasant improvement in tone quality resulted.

Mr. Sprague called the device simply a "Tone Control" and applied for patents on both the condenser and the complete device. The patents were granted and on June 1, 1926 the fledgling business was incorporated.

The Tone Control did not, however, take the public by storm. Sales were modest and it soon became apparent that if the young company were to succeed, a new approach must be taken. Even at that early date the young electronics industry was highly competitive. What to do! The condenser, or heart of the Tone Control, provided the answer. Less than one-half the size and only one-eighth the weight of the standard Mica condenser then in use, it was also much cheaper to build and rigorous tests showed it had all the needed electrical and life characteristics, including an exceptionally high voltage breakdown.

The decision was made, and the new company was in the condenser, or capacitor, business as it came to be known. The Midget capacitor was a success with radio set manufacturers. Sales for 1927 were a satisfactory $54,000; for 1928 a whopping $234,000 with a net profit of $35,000. By 1929 the original two employes, Mr. & Mrs. Sprague, had increased to a peak of five hundred and fifty. This was a substantial business operation.

How satisfying if operations could have continued in this productive manner. In 1929 two facts became abundantly clear. Manufacturing space in Quincy was definitely limited, and a number of competitors were hot on our heels, indicating that the profit margin and market for the Midget would be declining.

At this point two strategic decisions were made. The first was the establishment of a small research and development department staffed by trained scientists and engineers. The second was the purchase of a large textile mill in North Adams for the expansion of operations. The property in North Adams was purchased three weeks before the fateful "crash" of October 1929. Plans for the transfer of operations proceeded, however, and the move was made. At the end of 1930, the Company books showed another highly successful year, sales wise. The one small cloud on the horizon was a disturbing downward trend in the ratio of profits to net sales.

In 1931 it happened - the roof

Continued on page 7, col. 1

NOW . . . 1966

Still Growing After 40 Years
A Success Story

As we share in this year's celebration of Sprague Electric's 40th anniversary it is an appropriate time to review a few facts about the Company and its growth from a simple home workshop to a worldwide corporation.

We are all dreamers of a sort and like to think that corporations, like Topsy, just grow. Unfortunately this is not so. Nothing is stationary, whether it be in business or personal affairs. All things either progress or decline. To progress and be successful a company must take in more money than it pays out. The difference, which we call profit, is used to repair equipment, buy necessary new machinery, pay interest to those who have invested in the company, and to provide a reserve fund for emergencies.

The Company and The Individual

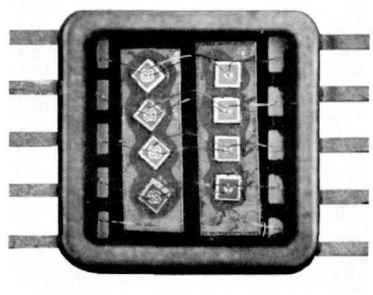
Most people find it difficult to really understand that a company is just like a family. They have heard it said often enough, but somehow they don't really believe it. In your own family you have a certain number of dollars to spend. You must have food, clothing and housing. Other things, the extras, must be provided from your personal profit – the money you have left over. If you want to improve yourself, you think about learning a new skill or about advancing yourself in your present job by acquiring more knowledge. A company hires people to improve on its products and develop new ones. This will provide more business. As a company, Sprague Electric has been very successful in the area of new products. It has kept abreast, and in most instances ahead, of its competitors and has earned an outstanding reputation throughout the industry.

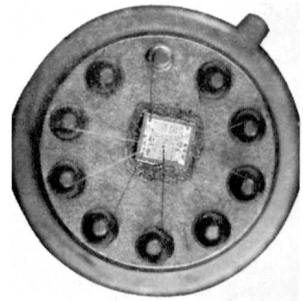
The Profitable Company

There is another correlation between the company and the individual employe which is often overlooked, and that is

Continued on page 8, col. 1

Microelectronic Devices





The work of Sprague Electric in semiconductor integrated circuitry is a logical outgrowth of many years of research on semiconductor materials, of its original large scale effort in germanium and silicon transistor technology, and of its several years of basic investigations of the physical and dielectric properties of the silicon-silicon dioxide system.

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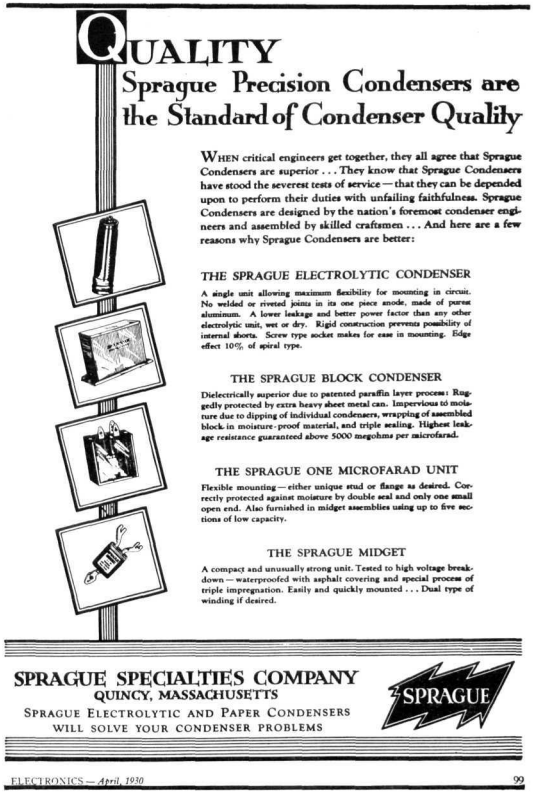

QUALITY
Sprague Precision Condensers are the Standard of Condenser Quality
WHEN critical engineers get together, they all agree that Sprague Condensers are superior . . . They know that Sprague Condensers have stood the severest tests of service — that they can be depended upon to perform their duties with unfailing faithfulness. Sprague Condensers are designed by the nation's foremost condenser engineers and assembled by skilled craftsmen . . . And here are a few reasons why Sprague Condensers are better:
THE SPRAGUE ELECTROLYTIC CONDENSER
A single unit allowing maximum flexibility for mounting in circuit. No welded or riveted joints in its one piece anode, made of purest aluminum. A lower leakage and better power factor than any other electrolytic unit, wet or dry. Rigid construction prevents possibility of internal shorts. Screw type socket makes for ease in mounting. Edge effect 10%, of spiral type.
THE SPRAGUE BLOCK CONDENSER
Dielectrically superior due to patented paraffin layer process: Ruggedly protected by extra heavy sheet metal can. Impervious to moisture due to dipping of individual condensers, wrapping of assembled block in moisture-proof material, and triple sealing. Highest leakage resistance guaranteed above 5000 megohms per microfarad.
THE SPRAGUE ONE MICROFARAD UNIT
Flexible mounting — either unique stud or flange as desired. Correctly protected against moisture by double seal and only one small open end. Also furnished in midget assemblies using up to five sections of low capacity.
THE SPRAGUE MIDGET
A compact and unusually strong unit. Tested to high voltage breakdown — waterproofed with asphalt covering and special process of triple impregnation. Easily and quickly mounted . . . Dual type of winding if desired.
SPRAGUE SPECIALTIES COMPANY
QUINCY, MASSACHUSETTS
SPRAGUE ELECTROLYTIC AND PAPER CONDENSERS WILL SOLVE YOUR CONDENSER PROBLEMS
SPRAGUE
ELECTRONICS — April, 1930
99

What Is A Condenser?

(from the September, 1938 LOG)

A condenser is a device that stores or concentrates electricity. When it is storing electricity it is charged. The simplest form consists of two conducting plates such as copper, aluminum or tinfoil, separated by an insulating material such as air, oil, paper or mica. Such a condenser may be charged by connecting a battery to the two plates for a period of time and then disconnecting the battery. If a wire is connected to one plate and the other end brought near the other a spark will jump. In some cases this may be repeated several times before it becomes necessary to charge the condenser.

A perfect condenser would hold its charge forever unless discharged by some means. Since the best insulators will conduct electricity to some extent, the charge will leak off and the condenser will become discharged. A good condenser will hold electricity longer than a poor one. Such a condenser has low leakage current and high leakage resistance.

A condenser may be compared to two tanks connected by a pipe with a valve in it. When the valve is closed and one tank is filled with water to a higher level than the other, we have a charged condenser. If the valve is opened the water will flow until the level in the two tanks is the same and the condenser is discharged. If the valve does not leak when closed we have a perfect condenser. If the valve leaks the condenser has leakage.

In 1746 Benjamin Franklin used the condenser formed between the clouds and the earth. This kite formed the wire used to connect the two. He discharged his condenser by drawing a spark between the key and his knuckles.

A filter condenser may be used for storing electricity for a short time and then delivering it to some other device. This corresponds to a reservoir. When there is plenty of rain the reservoir stores up water. During the dry period this water continues to flow into the water mains of the city so that water is available at all times.

A bypass condenser may be used to separate one electric current from another. This would correspond roughly to the use of sieves or screens to separate sand from gravel or for grading coal.

A tuning condenser is used to determine or change the frequency characteristic of an electric circuit as for example the tuning of your radio from one station to another. In watches and many clocks a small spiral spring is attached to the balance wheel. By regulating this spring we can speed up or slow down the speed of the clock. In the radio the condenser is varied to increase or decrease the wave length or frequency of the electric currents. The radio in your home has a condenser in it that performs the above functions.

NATIONAL ADVERTISING - 1930

Even before the move to North Adams a modest nationwide advertising campaign was initiated. From the beginning "quality" was the key word as illustrated in the above ad - the first to appear in a national magazine. At that time business was often sporadic and dependent on the highs and lows of radio manufacturers. As we review the growth of Sprague Electric we cannot help but notice the steady growth and the forward looking decisions on which early activities were conducted. Product development was important, and it was equally important to bring the new products to the attention of buyers.

During the following years the advertising expenditures were increased and by the 1940's a four-way program reached around the globe.

First were the advertisements directed to manufacturers who bought capacitors for use in original equipment such as radios and electronic and electrical equipment. These were usually full-page ads in all the important technical magazines.

The second group of ads were for KOOLOHM resistors - a very important product. Originally manufactured in North Adams, the line was moved to Kingston, New York and later to Nashua, New Hampshire where the units are still produced in large quantities today.

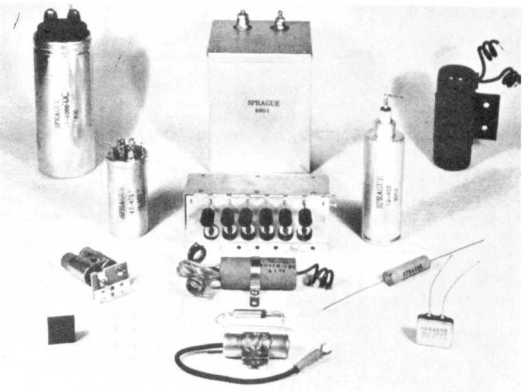
The third advertising area was for the Sprague Products Company. These ads were designed to reach servicemen, dealers and distributors.

The fourth area was a modest amount spent for the export area. This was also to expand greatly following the War.

THE BIG JOB

During World War II thousands of engineers were in the service. At War's end they would scatter to private firms all over the country. It was Advertising's business to make Sprague capacitors and resistors well known so that when our salesman called on a private company after the War, he would be a welcome representative.

Advertising was also the best way to inform buyers of the many new Sprague developments. The Harry P. Bridge Company, Advertising Counsellors of Philadelphia, handled accounts in the early campaigns and are still doing it today.



Early Sprague Developments

During the 1930's electronic equipment began to play an increasingly important role in the American way of life. Television was a new word, but it would soon be a household standby. During this time, Sprague engineers and scientists were hard at work on the new products which would be emerging with the advent of World War II, but even in the 30's the product line was growing rapidly.

Shown in the photograph: Back row, left to right - (units used in a) television set; telephone; electric refrigerator. Second row from back: Radio condensers - dry electrolytic, radio push button assembly, and wet electrolytic. Third row from back: the new coaxial condenser, dry electrolytic, paper condenser (in front of dry electrolytic), liquid compensator condenser. Front row: condensers used in electric razor, automobile generator, automobile radio.

The Beaver Street Plant in North Adams was the only manufacturing operation during the 1930's, but the Company was growing and it was apparent that additional areas would soon be necessary.

Robert C. Sprague Expressed His Thoughts About 'Industry Under War Conditions'

Robert C. Sprague

Prior to this country's entrance in World War II its effect was apparent as we provided assistance to various European countries. In the July 1940 LOG, Mr. Sprague expressed his thoughts.

"As this issue of the LOG goes to press, our country is beginning to feel the effects of the war in Western Europe and of the determination of this country not to be caught unprepared in this time of emergency. In our resolution to build a strong defense, it must not be overlooked that vigorous, efficient industries are one of the most important assets that a nation can have. In a recent speech a high official in the United States War Department declared, 'An America prepared on the industrial front will do more to discourage attack against us than perhaps any other single factor in our preparedness program.' I agree with that sentiment. The mechanization of war stresses as never before the importance of industry in a nation's struggle for survival and progress.

"Besides the economic effects of the war, an important psychological effect can also be seen. I should describe it as not unlike the general feeling of apprehension that existed at the time of the panic in 1929-30. It is doubly important at this time, therefore, that we concentrate our full attention on the problems at hand in our own lives and our own business.

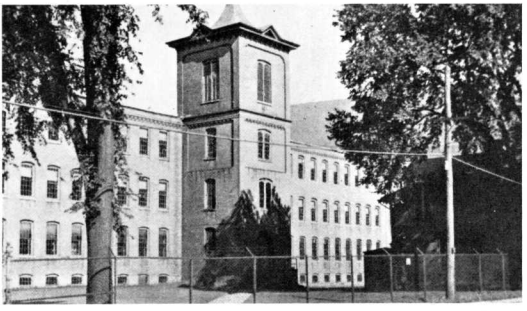
"Inevitable results of the war and the country's preparedness program are already being felt. The most important of these are the shifts taking place in demand. The coming months may see less automobiles produced in favor of more airplane motors, etc., but production will go on. Disruptions in the supply of raw materials have become evident in certain lines and there is no doubt that we shall have to face the possibility of more fluctuations in prices.

"I recently noticed a picture in Life magazine showing a German tank with a 'fish pole' aerial at one side. This gives a hint, I think, of the important role which the radio business and our business will have to play in building an up-to-date defense for the country.

"Through all this, the quality of adaptability and willingness to give our full efforts to new tasks and new ways of doing them will be extremely important. The young and flexible company whose management and employes have open minds will inevitably forge ahead.

"Sprague Specialties is a young company and I am proud of the vigor and enthusiasm of its employes and management. These qualities and the ability to adapt ourselves to sudden changes will contribute much to our progress in the coming months."

Brown St. Plant Acquired - - 1937



The Brown Street Plant, purchased in 1937, was a typical New England textile mill. Today the exterior looks much as it did thirty years ago, but the grass has given way to asphalt for parking and there is a sidewalk, instead of a dirt path, in front of the fence.

The second North Adams plant, Brown Street, was purchased in 1937. It was an important step for the Company as it signified anticipated growth. The substantial debt incurred from the severe financial reverses of the early 1930's was finally liquidated, and a firm base had been established on which to expand operations. Research and Engineering personnel were hard at work on products which were to prove most beneficial.

Business firms, like individual families, have ups and downs. In the Fall of 1937, and continuing until the Fall of 1938, there was a marked contraction in sales. This involved some serious problems and adjustments. Sales were off 30% and there was a marked softening in many prices. Fortunately we were also introducing several new items at this time which were to prove profitable.

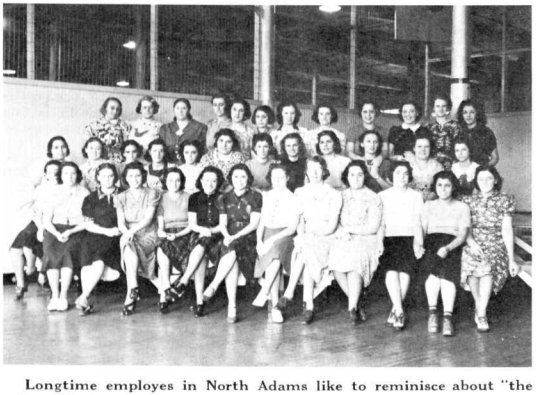
RESEARCH STRESSED

The essential and vital importance of continuous and uninterrupted research and engineering was indicated by the astonishing fact that none of the items which made up our entire sales in 1928, 1929 and 1930 were sold in 1938. In other words, if we had stopped research and development in 1930, our sales would have been "zero".

Similarly, new items introduced in 1931, 1932, 1933 and 1934 contributed only about one half of our 1938 sales volume. If research and engineering had been terminated in 1934, our 1938 sales would have been reduced about one half. Condensers accounting for the balance of 1938 sales volume were developed as recently as 1935, 1936, 1937 and 1938.

Although the Brown Street plant had been purchased, it was not to be occupied until early 1941 when Sprague Electric began work on a government order for the manufacture of gas masks. When the opportunity came, we were prepared and as the war clouds deepened, production increased at an even faster pace.

LONG SERVICE NORTH ADAMS EMPLOYES REMEMBER



Longtime employes in North Adams like to reminisce about "the old days". There was a friendly feeling of comradeship throughout the group. With a one-plant operation, everyone was on a first-name basis. The group above were in Paper Rolling.

Any special occasion was a good time for a party. From the paper hats above it seems a birthday party may have been in progress. This group was from the K. V. A. Department and you may recognize some of the faces. The Department is now located at Brown Street.

SPRAGUE CONVERTS TO WARTIME PRODUCTION

As part of the Army-Navy "E" Award ceremonies visiting military personnel were taken on tour of the Company's manufacturing facilities. Many components were built for top secret weapons, and the employes knew only that their work was extremely important to the War effort.

The North Adams' operations were a veritable beehive of activity with high school students and housewives employed on a part time basis. Large red, white and blue signs reminded the employes of the vital work being performed. Families at home were anxious to do everything in their power for the men at the Front.

Army-Navy "E" Award Flags Give Proof of Production Efforts

Five Army-Navy "E" Awards and the Navy Bureau of Ordnance "E" Award were made to the employes of Sprague Electric Company, Beaver and Brown Street Plants, during the course of World War II in recognition of their exceptional production record in the War effort. The Army-Navy "E" pennant was awarded to the Company for high achievement in war production and for untiring efforts on the home front.

Spaced out during the course of the War, the first award was announced on February 27, 1943 and the others were announced on September 25, 1943, April 22, 1944, October 28, 1944 and May 12, 1945. The Bureau of Ordnance "E" award for the Company's work on the VT or proximity fuze was delayed due to the cloak of secrecy which surrounded the project, and was not made public until September 1945.

An extensive program was planned for the formal presentation of the first award. The day of the program was officially declared "Sprague Day" by Mayor Cornelius E. O'Brien for all of North Adams. Speaking at the presentation program Robert C. Sprague said, "This is a day we will never forget. We must work hard, long and intelligently, never forgetting that every added unit we ship will help shorten the war. It is with utmost confidence that we will in the future surpass anything we have already done that I personally congratulate and thank each and every one of you for your part in winning this award, and pledge to the Armed Services our maximum possible production."

From that day forward all Sprague employes proudly displayed the "E" award emblem on their clothing, and a renewed spirit of dedication on-the-job was clearly evident.

We Give Our Answer

None knew the destiny of our nation when Poland was invaded in September 1941. None knew the destiny of Sprague. With courage and foresight the Company concerned itself with the needs of a great nation which might soon be drawn into war.

In June 1940 a contract with the Chemical Warfare Service warned our people of what was ahead - Sprague was to make gas masks. Laboratories were rushed to completion; manufacturing and warehouse space reserved for emergencies; new machinery and new stock were ordered and built. In six months to a day the first gas mask rolled off the assembly line. This was our first war production.

WAR IS DECLARED

When Pearl Harbor came Sprague was ready. Everything gave way to the grim necessities of war. Within a few weeks, the manufacture of peacetime products stopped. Sprague began the greatest conversion of manufacturing design in its history. Training classes were formed as employment figures went up and up. Existing space was soon crowded to the limit; further expansion was made at the large Brown Street plant, and later at leased properties on Marshall Street.

THE NEW FILTER DEPARTMENT

The Army Signal Corps and the Air Corps came to us for new filter designs. Constant radio communication between planes, tanks and other mobile units must be maintained in a modern army, but the complex ignition and control systems of planes and vehicles hindered the use of the delicate radio apparatus required. Fortunately, we had accumulated much valuable experience in this field. We built a shielded laboratory large enough to garage military vehicles. We tackled and solved tough new problems involving the extremely technical requirements of aircraft design. The Filter Department was born.

PRECISION RESISTOR

A new precision resistor needed by the Armed Forces was built to specifications which the industry had hitherto never been able to meet. It had to stand immersion in boiling water or freezing sea water, and be built to such accuracy in resistance value that even the most severe test would not cause a variance of over ½ of one per cent. Sprague knew the answer because of seven years of basic research applicable to this problem. Engineers rushed final designs. The life test men ate and slept on their job for a week in order to make the continuous 150 hour test required. Within three weeks after action was requested, we gave our answer: "No one has ever been able to do it before, but we have done it, and here it is!"

That was our answer to dozens of problems - an answer that showed what peaceful men and women can do when they get fighting mad.

V-T FUZE EFFORTS A MAJOR CONTRIBUTION

In what the Navy Department considered a "miracle of production skill" the Sprague Electric Company played an important role in the success of the Navy's number one secret weapon, the V-T or proximity fuze. Regarded as second only to the atomic bomb, the V-T fuze was used to successfully combat the German buzz bomb menace in England and the Japanese suicide planes.

At the height of production, 2600 employes were involved in manufacturing components for the highly secret weapon. They had no idea of the exact use of the units - they only knew that it was highly important to the War effort. In October 1945, the Company received their fifth "E" Award; this one from the Navy Ordnance Department for Sprague's contribution to the heretofore highly secret device.

In North Adams The Women Went To Work

From the Boston Herald, August 1, 1943.

In this mill city you can't find a fourth for bridge. The main reason is that 3000 women, many of whom used to spend part of their afternoons card shuffling, are working for Sprague Specialties Company, which makes such things as condensers, resistors and gas masks and has won the Army-Navy production award for achievement.

You can't make up that bridge table if you go far behind today's teenagers. Sprague is making old age pensions unnecessary. Ten percent of the employes are more than 60 years old. Two women, aged 67 and 63, drive every day from the town of Savoy, 14 miles away. Before she leaves her farm, the older one milks nine cows. The younger one milks four. There are 75 three-generation families employed there.

You can't find your fourth even if you go among the physically handicapped. There are 556 such persons on the Sprague assembly line. One of them is a dwarf who has a made-to-order sized table and chair.

Most of the women working there have children and family problems. All the town's domestics have gone to work in this or other North Adams factories. You can't find sitters to look after young children...Even with their family problems, these housewives keep absenteeism down to 2 per cent, and that is well under the average.

"These are just people who want to be doing something toward the War," said John D. Washburn, Personnel Executive of the Company. "Almost everybody who can see lightning, hear thunder or walk is taking his turn here."

CURRENT NEWS

Dr. John L. Sprague Addresses N. H. Tech Graduates

Dr. John L. Sprague, Senior Vice President of Research and Development, delivered the commencement address to the first graduating class of the New Hampshire Technical Institute in Concord, New Hampshire. A class of 29 students received Associate Degrees in Electronic Engineering Technology or Mechanical Engineering Technology.

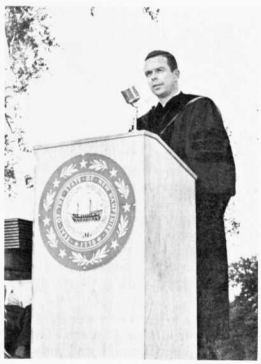
Dr. Sprague, who was introduced by Robert L. Parrish, Sprague Electric General Manager of Tantalum Operations, urged the graduates to continue their education, if possible. He noted that the world's knowledge is doubling approximately every eight years and that as we learn more and more we come to. the realization of how little we really know.

In reference to Sprague Electric Company, Dr. Sprague pointed out that the new field of microelectronics is probably the most exciting and stimulating in the entire electronics field today. Work in this field, however, requires extensive education and key technical people are generally familiar with most, if not all, of the complicated disciplines.

The Associate Degree in Applied Science which the Technical School graduates received qualifies them for placement at a semi-professional level and allows them to prepare for promotion as experience is gained. It provides a broad background for continuing education, both formal and informal.

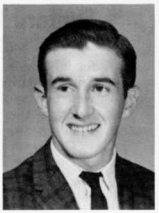
Dr. Sprague emphasized that he did not wish to sound discouraging and he noted that today's scientific technology requires nearly as much art as science. "People with this special skill," he added, "like the very skilled mechanic or experienced production supervisor, are invaluable."

In closing Dr. Sprague said, Graduation today is not an end but a beginning. The challenge and the opportunities are there. The rest is up to you."

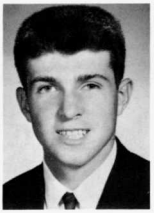


Dr. John L. Sprague

K. Caraway



R. Milo

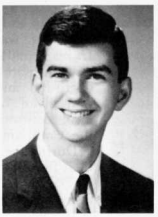


G. Joyce

T. Daigneault

K. Moors

R. Gamache



R. Scrivens

R. Scholz

L. Yarter

D. Girard

Scholarships Awarded To 10 High School Seniors For College Studies Applicable To Employment At S. E.

Ten Sprague Electric scholarships were awarded to high school seniors at graduation ceremonies in their respective schools. Seven of the 10 scholarships were awarded to children of Sprague employes. At the Ashe County, North Carolina Plant Kenneth Ray Caraway, son of Joseph Caraway, received the award; at Concord, New Hampshire, Rene A. Milo, son of Jean Milo, was the recipient; and at Nashua, New Hampshire, Gerald R. Joyce, son of Mary Joyce, received the award. The Sprague Electric General scholarship, awarded at a location which does not have a scholarship of its own, was presented to Thomas W. Daigneault, son of Martin J. Daigneault of the Plymouth, New Hampshire Plant.

In North Adams, six awards were made. Three went to children of employes and in addition, area students were granted an engineering scholarship, a cooperative engineering scholarship and a nursing scholarship. Children of employes were Kent Francis Moors, son of Gloria Moors; Ronald Walter Gamache, son of Aline Gamache; and Robert Allan Scrivens, son of Doris Scrivens. The Sprague Electric Engineering Scholarship was awarded to E. Richard Scholz, of Adams, Massachusetts; Louis Russell Yarter, of North Adams, received the Cooperative Engineering Scholarship; and Donna Marie Girard, of Adams, was awarded the Nursing Scholarship.

Children of employes and the winner of the Engineering Scholarship are awarded $500 a year for four years, a total of $2000 each. The Cooperative Engineering Scholarship is a $500 grant for one year, and the Nursing Scholarship is $400. In addition to the student's award, Sprague Electric provides a grant to the school or university equal to one half the scholarship. This may be used in any constructive manner the school deems appropriate.

Kenneth Caraway is a graduate of Ashe Central High School (North Carolina) where he ranked 11th in a class of 97. He plans to attend the University of North Carolina where he will major in electrical engineering. During high school he was on the Annual Staff, Student Council, a member of the Beta Club, FFA, French Club, Science Club and was active in football. In 1966 he served as President of the Student Council and was also voted "Mr. Ashe Central."

Rene Milo is a graduate of Concord High School and has been accepted at Rensselaer Polytechnic Institute, Troy, New York where he plans to major in electrical engineering. While a student, Rene was a member of the National Honor Society and a member of the Concord High School Cross Country and Spring Track teams. He has also been active in church activities as a member of the Youth Fellowship and the choir.

Ranking fourth in his class, Gerald Joyce has been especially outstanding in subjects of a scientific and mathematical nature. He was also active in the extra curricular life of the school as well as many out-of-school activities.

Young Joyce will enter the University of New Hampshire in the Fall and will major in physics with further plans of obtaining a masters degree.

Thomas Daigneault plans to enter the University of Vermont where he will major in science. He ranked in the top 10% of his class and was active in extra curricular activities in addition to being a good student. He was a member of the Student Council and the National Honor Society and was a letter man in baseball, basketball, football and track.

Kent Moors was an honor student at St. Joseph's High School in North Adams and a member of their St. Thomas Aquinas Honor Society. He served as president of the Forensic League and was a member of the St. Joseph's debating team for two years during which time they won two state championships and two diocesan championships.

Mr. Moors plans to attend Boston College where he will major in political science and pre-law. He hopes to enter the field of corporate law.

A graduate of Adams Memorial High School, Ronald Gamache will attend Rensselaer Polytechnic Institute where he will major in nuclear or solid state physics. A Pro Merito student, young Gamache served on the Yearbook staff, was a member of the Chem Club and the Fencing team. During summers he has done radio and TV repair work.

Robert Scrivens, a graduate of St. Joseph's High School, will enter the University of Notre Dame where he will pursue a five year course of study including liberal arts and majoring in electrical engineering.

In high school he was co-editor and art director of the school paper, served on the Yearbook staff, participated in the senior play and was president and treasurer of the Key Club. He also played basketball and baseball and served as journalism class instructor.

Richard Scholz, winner of the Engi-

Continued on page 4, col. 3

Sanford Family Day Scenes

Some of the nearly 700 visitors who toured the Sanford Plant during the first Family Day are shown registering prior to the guided tours of the manufacturing facility and displays.

Ernest L. Ward, President, (2nd right) and Martin J. Daigneault, Plant Manager, (left) are shown with two visitors in front of a map on which the location of all Sprague Electric plants is depicted. The display is part of a large exhibit showing Sprague products and the widespread utilization.

Refreshments of punch, cookies and ice cream were served in the Plant Cafeteria to all Family Day visitors at the conclusion of guided tours throughout the building.

Anthony N. Sacco, Corporate Safety Supervisor, (left) is shown explaining a wide variety of safety equipment used by Sprague Electric throughout its many operations.

Community Leaders And Employes Enjoy Sanford Family Day

Nearly 700 persons, including Sanford business and civic leaders and Sprague employes and their families were on hand for the first Family Day held at the new Sprague Electric Plant in Sanford, Maine.

The event, which marked the official opening of the new Plant, included small group guided tours of the Tantalum and Ceramic capacitor manufacturing facility, several interesting displays and refreshments.

The morning tour for local community leaders, industrialists and businessmen was followed by a luncheon at which Ernest L. Ward, President, was the principal speaker. In his remarks, Mr. Ward expressed faith in more growth for the Sanford operation and praised the cooperation given by the community and local contractors for the rapid start the Company has made in Sanford.

During the afternoon, employes and their families were greeted by Martin J. Daigneault, Sanford Plant Manager, and Wendyl A. Reis, Manager of the Nashua, New Hampshire Plant and the Ceramic Monolythic Operation in Sanford. They were then guided through the entire manufacturing line. At the conclusion of the tour, refreshments were served in the Cafeteria.

Among the interesting displays was an exhibit of safety equipment which was explained by Corporate Safety Supervisor Anthony N. Sacco. Another exhibit which generated much interest was a display of the complete line of products manufactured by Sprague Electric as well as several pieces of commercial equipment indicating the wide utilization of the units.

14 Employes Share Awards of $1,955

Two large suggestion awards were made recently to North Adams employes. Frederick George, of the Metallizing Department, received $720 for an improved method of sharpening the blades on the paper slitter of the metallizing machine; and Frederick Baker, of the Machine Shop, was awarded $370 for his idea to improve the aluminum caps used on the grinding machine in the Ceramic Department.

At the past two Suggestion Committee meetings a total of $1,955 was paid to 14 suggesters for their accepted ideas. Rudolph Drobiak, of the Machine Shop, and Robert Rivers, of High Reliability Foil, were each $125 richer for an improvement in their respective areas, while Judith Pedercini, of Plant Engineering, received $120 for a cost saving procedure.

Co-suggesters Helen Harrington and Walter Tatro, Jr., of Miscellaneous Papers, each received $110 and Irene Rowley, of High Quality, submitted an idea worth $90. A Film Products employe, William Lauth, received $50 and Norma Sartori, of Ceracircuit Production, was awarded $45. Twenty-five dollar checks went to Arlene Bedard, of General Accounting; Frederick Curtis, of Formation Control; and Edward Mulvaney, of Mica. George Shakar, of Networks, received $15.

J. L. Hennessey New St. Louis Dist. Mgr.

James L. Hennessey has been named St. Louis District Manager, it was announced by Carroll G. Killen, Vice President, Industrial and Military Sales.

Mr. Hennessey comes to Sprague Electric from Vickers, Inc., in St. Louis, where he has been in charge of district sales for the Electric Products Division for the past six years. A graduate of St. Louis University with a degree of bachelor of science in electrical engineering, Mr. Hennessey also holds a master's degree in business administration from that institution.

A native of St. Louis, Mr. Hennessey and his wife, the former Judith Jacobsmeyer, make their home in Florissant, Missouri.

Dearborn Employe's Daughter Achieves Scholastic Record

Beryl Davis, daughter of James Davis, Customer Service Manager at Dearborn Electronics, graduated with a perfect 4.0 scholastic average over a four-year period from Oak Ridge High School, Orlando, Florida. This was the first time in the school's history that a student had achieved this highest of possible grades.

Miss Davis has received awards for her outstanding scholastic performance from the U. S. Jaycees, Kiwanis, American Legion, Reader's Digest and the State of Florida. She is a member of the National Honor Society, Editor of the school magazine, The Intelligensia, Treasurer of Tri-Hi-Y, member of the Chemistry Club, Inter Club Council, Math Club, FHA, Latin Club and a varsity cheerleader.

Miss Davis was awarded a scholarship to Emory University, Atlanta, Georgia where she will major in psychology.

Kenneth C. Casperson

Peter J. Wol, Jr.

Superintendents Announced For Two Areas of Special Components Division

Two new appointments for the Special Components Division were recently announced by Harold F. White, Plant Manager. Peter J. Wol, Jr. has been named Superintendent of Ceracircuit Manufacturing on Marshall Street, and Kenneth C. Casperson has joined the Division as Superintendent of the BRMJ Department. Mr. Casperson will be responsible for all Delay Line manufacturing in addition to the Pulse Transformer line.

A native of Adams, Massachusetts and a graduate of Adams Memorial High School, Mr. Wol attended the Radio & TV Institute in New York City and has taken University of Massachusetts extension courses in Pittsfield. Following graduation from the Institute he was employed by General Electric Company in Pittsfield, Massachusetts for a short time and also served in the U. S. Signal Corps for two years.

Mr. Wol joined Sprague Electric in 1955 as a Technician in Research and Engineering. With the establishment of the Special Components Division in 1958 he transferred to Union Street where he held positions as Foreman, General Foreman and Coordinator prior to his present promotion.

Mr. Wol's wife is the former Ilene Kellar of Adams.

Mr. Casperson is a native of North Adams and a graduate of St. Michael's College, Winooski Park, Vermont. Following graduation he joined the Cornish Wire Company, Williamstown, Massachusetts as a Supervisor and later was promoted to Foreman, Superintendent and Plant Manager.

Mr. Casperson assumed his new duties at Sprague Electric on June 7. His wife is the former Arlene Joseph of North Adams and they are the parents of a daughter.

Baldwin & Houmiel Join Ind. Relations

B. Baldwin

F. Houmiel

Two industrial relations additions were recently announced by John D. Washburn, Corporate Director of Industrial Relations. Barbara Baldwin has been named to the newly created position of Industrial Relations Coordinator for the Los Angeles, California operation and Frank R. Houmiel has assumed the duties of Assistant Industrial Relations Manager at the Concord, New Hampshire plant.

Miss Baldwin is a 1964 graduate of Skidmore College, Saratoga, New York where she majored in political science. For the past two years she has been employed by A. C. Nielsen as a Test Marketing Manager.

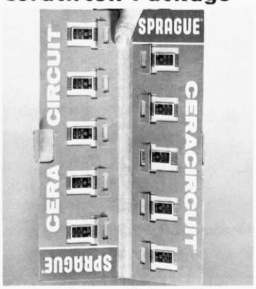
Following a training period in North Adams, Miss Baldwin assumed her duties in Los Angeles in mid-July.

A native of Ogdensburg, New York, Mr. Houmiel is a graduate of St. Lawrence University, Canton, New York with a B.A. degree in sociology. Following graduation he joined the U. S. Navy as a Lieutenant. From 1962-1964 he served as Fire Control Officer on the USS Forrestal and from 1964-1966 was Assistant Director of the Naval Reserve Division.

While stationed in Washington, D. C., Mr. Houmiel acquired credits toward an M.S. degree in personnel management at George Washington University. He is a member of Sigma Alpha Epsilon fraternity.

Mr. Houmeil's wife is the former Lorraine Shepherd of Niagara Falls, New York and they are the parents of two daughters.

Ceracircuit Package



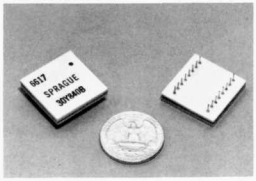
Story - Column 3

Sprague Employes Receive Awards At Natl. Conference

Four Sprague Electric employes received awards at the National Electronics Packing and Production Conference held recently in New York City. Darnall Burks, a Physicist, was awarded a first prize in the Thin Film Products and Processes group for his hermetic ceramic package of hybrid thin film microcircuits. The ceramic (alumina) substrate is utilized as an integral structural part of the package.

The second prizewinner was a CERACIRCUIT shipping folder designed by Harold May, Design Engineer; Jacob Martin, Technical Assistant to the Vice President of Engineering; and William Seeley, Design Engineer. The three men shared a First Merit Award in the Production Techniques category.

The awards were made for "excellence in conception, design execution and production technique". The thin film unit and the packaging folder, which are being patented by Sprague Electric, were on display at the Conference.



Ceramic Package

Masters Degrees For Two Sprague Men

W. Clement

W. Wesolowski

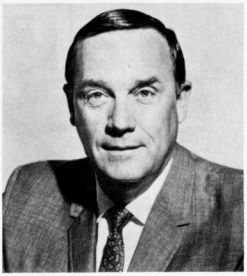
Two Sprague Electric employes, Warren J. Clement and William E. Wesolowski, both of Engineering, were awarded masters degrees for study completed under the Company educational sponsorship program. Mr. Clement received a master of science degree in science and mechanical engineering from Rensselaer Polytechnic Institute and Mr. Wesolowski was awarded a master of science degree in chemistry from Williams College.

A native of Dallas, Texas, Mr. Clement joined Sprague Electric in the Engineering Laboratories in 1961 following graduation from Texas A & M, College Station, Texas with a bachelor of science degree. Prior to that time he had served in the U. S. Air Force for three years and had also received a bachelor of arts degree from North Texas State College, Denton, Texas.

Mr. Wesolowski is a native of Windsor, Massachusetts and received his secondary education in Greenfield, Massachusetts. In 1958 he graduated from Worcester Polytechnic Institute with a bachelor of science degree in chemistry. Following graduation he joined Sprague Electric in solid tantalum engineering and in 1960 transferred to Sprague's Concord plant. In 1961 he returned to North Adams and enrolled in the master's program at Williams.

A second lieutenant in the U. S. Army Reserve, Mr. Wesolowski spent six months on active duty in 1959. He has served as a town meeting member in Adams and is a member of Lambda Chi Alpha fraternity.

R. W. WOODBURY NAMED ASST. TO H. KALKER



Appointment of R. W. (Bill) Woodbury as Assistant to the President of Sprague Products Company has been announced by Harry Kalker, President. In his new post, Mr. Woodbury will have responsibility for over-all operations of the Sprague Products Company. He succeeds the late E. Bruce McEvoy in this position.

Mr. Woodbury has been associated with Sprague Products Company for the past 15 years, first as Southern California District Manager and more recently as Western Regional Manager, with the responsibility for supervision of distributor sales in the Pacific and Mountain States.

"Except for war-time service with the U. S. Navy, Mr. Woodbury has had some 30 years experience in the electronics industry with distributors, as a distributor, and as a manufacturer's distributors' sales executive," Mr. Kalker said in making the announcement. "He has broad acquaintance with all aspects of electronic parts distribution and a particularly thorough understanding of distributors' problems," Mr. Kalker commented. "He is, of course, a senior member of the team which has brought Sprague Products to its position of leadership and will carry through with Sprague philosophies of distribution which he helped establish."

Mr. Woodbury is President of the Association of Electronic Manufacturers, Western Division; Chairman of the Distributors' Sales Group of the Western Electronic Manufacturers Association; Chairman of the West Coast Region of the EIA Distributor Products Division; and Vice Chairman of the EIA Distributor Products Division.

- Picture Highlights -

Gerard V. Tremblay, President of Sprague World Trade, (right) met with World Trade Managers in Frankfurt, Germany to plan our sales program. Shown with Mr. Tremblay (from left to right) are: Luigi DeMarinis, Italy; Mario Fortini, Italy (partially hidden); Didier Franc, France; Philip Farmer, England; George Meier, Frankfurt; Hans Kihm, Zurich; and Peter Krahenbuhl, Zurich.

The North Adams' Management Club recently presented a rowboat to the Herbert W. Clark Day Camp for use in their summer program. John Marciano, Camp Director, (in boat) accepted the gift which was presented by Zygamond Nash and Gerald Dubois on behalf of the Management Club. Conducted under YMCA sponsorship, the Camp is open for six weeks each summer.

Company sponsorship of educational courses was a family affair in the case of Bernard and Aime Thibert as the two brothers received certificates for completion of courses in their particular area of interest. John B. Ortman, Manager of Engineering Services, (left) presented Bernie his diploma for a course in Professional Locksmithing from the Locksmithing Institute. He completed the three year course with a straight "A" average. Aime's certificate, presented by Dr. James J. Casey, was for a course in Elements of Metallurgy prepared by the Metals Engineering Institute.

Grafton Employe's Daughter Chosen Miss Hobby Ceramics

Pat Carter, daughter of Elva Carter of Sprague of Wisconsin, Inc., was selected to be Queen of the 10th Annual Hobby Ceramics Show sponsored by the Badger Ceramics Association of Milwaukee, Wisconsin.

In the preliminary competition based on the judging of essays written by the contestants on the value of ceramics in education, Pat was one of five winners. The five girls were interviewed and Pat was chosen as final winner and named Miss Hobby Ceramics of 1966. She reigned over the two-day show which was held at the Sheraton-Schroeder Hotel.

The competition for position of queen was open to girls in Milwaukee area schools who have had some experience working in ceramics. As queen, Pat received a prize of a $100.00 War Bond.

Scholarships

Continued from page 1

neering Scholarship, was an honor student at Adams Memorial High School. He was a Pro Merito member and a National Merit Finalist. He will attend Worcester Polytechnic Institute where he will major in electrical engineering.

Richard is an Eagle Scout and was a member of the school gymnastic exhibition group. He also served on the Yearbook staff and participated in the senior class play.

Russell Yarter graduated from McCann Vocational Technical High School in North Adams and will enter Rochester Institute of Technology in the Fall in their five year cooperative program. While in high school he was class president for two years, president of the National Honor Society for two years, a member of the yearbook and newspaper staff and manager of the baseball team. He maintained honor grades throughout high school.

Donna Girard graduated from St. Joseph's High School and will enter Burbank Hospital School of Nursing, Fitchburg, Massachusetts in the Fall where she will be enrolled in their three year program.

While in school she held a part time job and in addition served as co-editor of the yearbook, business manager of the school paper and was a four-year member of the Glee Club.

R. Simmons Joins Marketing Staff

Robert C. Simmons has joined the marketing staff of the Special Components Division as a West Coast Regional Product Specialist, it was announced by William L. Moorhead who is in charge of the Division's Marketing.

Mr. Simmons will make his headquarters at the Los Angeles offices and will be responsible for technical assistance to Sprague's sales engineers and representatives in the Pacific Coast and Rocky Mountain areas.

Mr. Simmons is an engineering graduate of the University of Iowa and a member of the American Society of Mechanical Engineers. He was previously associated with Westinghouse Electric Corporation in various sales and engineering capacities for the past 11 years.

Equipment Donated

Richard C. Peterson, Manager of Instrument Operations, checks the instruction manual for a Tektronix oscilloscope with Mrs. Ann Olson, a science teacher at St. Joseph's High School in North Adams. Sprague Electric donated the equipment to the school for their science department.

Vol. XXVIII SPRAGUE ELECTRIC LOG No. 5

June-July 1966

MARION H. MANION
Manager, Corporate Publications

Circulation Manager: MARION CARON *Social Chairman:* ANN HEATH

Sports Reporter: ROGER DELISLE *Photographer:* ALBERT HORSFALL

Published by SPRAGUE ELECTRIC COMPANY, *North Adams, Mass.*

Post War Era Brings Expansion And Branch Plants

Reputation Earned During War Years Proves Beneficial

During the War many millions of electronic components made by Sprague Electric found their way to all parts of the world. Technicians in every country learned to know and respect Sprague equipment. Shipping containers and labels bearing the name of the company were a familiar sight all across this country and abroad. Many hundreds of executives, engineers, scientists, government officials and military men of importance made frequent trips to North Adams to visit the Sprague plants on business.

As the Company marked its 20th anniversary in 1946 it had weathered the worst depression the country had ever known and had set distinguished records for research, engineering and production during World War II. During the reconversion period following the War its employe enrollment was almost 100 times what it had been the first few weeks of operation in North Adams in 1930, and it occupied three large plants - Beaver Street, Marshall Street and Brown Street.

RECONVERSION—
A CHALLENGE

Immediately following VJ Day wholesale cancellation of war orders flooded the Sales Office. During the last year of the War Sprague Electric designed, engineered and manufactured nearly 10,000 different electrical components. This accomplishment and the experience gained from it placed the Company in an excellent position to go forward and to overcome the many difficulties of reconversion to successful peacetime operation.

On the 20th anniversary of the Company Robert C. Sprague said, "I am proud of our accomplishments, both in peace and in war, during the past twenty years. With the continued cooperation of our employes we will go forward together to even greater things in the twenty years ahead."

Ceramic Capacitors - - Important New Line

Ceramic capacitors, now a very familiar product, first appeared in volume following the War. They were manufactured by depositing conducting surfaces on a ceramic plate. Multiple capacitors could also be produced in a single unit and techniques were developed for the manufacture of printed circuits (capacitors and resistors deposited or "printed" on flat ceramic plates).

To further assist in Sprague Electric's development of ceramic capacitors the Company purchased the Herlec Corporation of Milwaukee, Wisconsin, a manufacturer of ceramic components. At about the same time a branch plant operation was started in Nashua, New Hampshire. The product here was also ceramic capacitors.

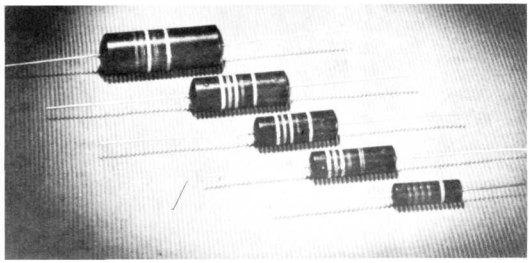
DU PONT MACHINE
ACQUIRED

Sprague Electric, through Herlec Corporation, acquired possession of an automatic machine for the production of vitreous enamel capacitors. Developed by Du Pont Company and the Signal Corps during the War, the machine produced the ceramic capacitors as a replacement for mica units. Mica was in extremely short supply since it was imported from India.

GROWTH CONTINUES

The production of ceramic capacitors proved to be a wise decision. Operations at Nashua showed a steady growth and that plant is still the largest of the branch operations. Herlec facilities were subsequently moved to Grafton, Wisconsin and a few years later the name was changed to Sprague of Wisconsin, Inc. Harry W. Rubinstein, one of the original owners of Herlec, continues today as the President of Sprague of Wisconsin.

Few, if any, Sprague employes in the late 1940's envisioned the growth of the Company that was to follow. Radio manufacture was booming, but television was a newcomer and space ventures were something to read about in science fiction. Nevertheless, the Electronic Age was arriving!



Plastic molded tubular capacitors, later trademarked BLACK BEAUTY, were instrumental in standardizing capacitor manufacturing. They also proved to be much more resistant to heat and humidity than paper capacitors.

New Plastic Molded Tubular Capacitor Sets Sales Records For The Industry

In July 1947 a new product, the plastic molded capacitor later trademarked as the BLACK BEAUTY, was introduced to the trade. It was to prove one of the most outstanding developments in the industry and a real moneymaker for Sprague Electric.

For a number of years the Research Department had been developing a new paper dielectric capacitor with improved performance characteristics and appearance. Up until this time small paper dielectric capacitors for use in radios and other electrical and electronic devices had been inserted in cardboard tubes, the ends of which were sealed by wax. The performance characteristics of the new molded far exceeded the standard paper tubular type and met with enthusiastic response from manufacturers.

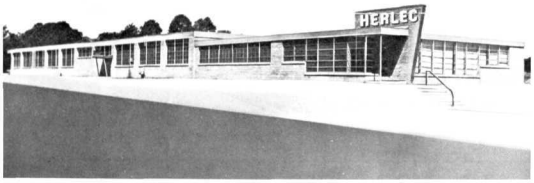
The improved characteristics made the units ideal for uses in all places where paper tubular capacitors were required, and they were particularly valuable in cases where resistance to heat and to humidity were important. Original demand was strongest for use in television sets, automobile radios and in electronic equipment used in humid areas.

MANUFACTURE
STANDARDIZED

Prior to the introduction of the molded capacitor it was the custom in the industry to manufacture paper tubulars to the specifications of large customers. As a result, there was always a considerable variation in physical dimensions and marking and most orders had to be handled separately. Plastic molded tubulars were manufactured and sold as standardized units. This standardization, together with the improved characteristics of the plastic molded capacitors, made it possible to manufacture for stock. This also lessened the previous seasonal characteristics of the radio business and helped steady our employment.

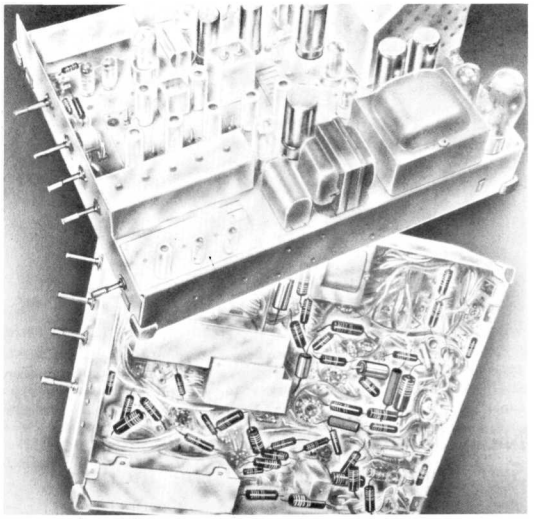
ROCK OF AGES
CAPACITORS, INC.

In December 1947 additional facilities for the manufacture of molded capacitors were installed at Rock of Ages Capacitors in Barre, Vermont. Orders had increased to such a degree that the Brown Street plant was not able to keep up with the demand. At a later date another operation, the first plant outside the continental United States - Ponce, Puerto Rico, also was opened for the production of the popular molded units.



Grafton, Wisconsin

Nashua, New Hampshire



A television set requires five to six times as many capacitors as a household radio. Shown above are simplified drawings of sets produced in the 1940's. In both the top and bottom views Sprague units are clearly visible. They include can-type and tubular electrolytics, molded tubulars and KOOLOHM resistors. Ceramic capacitors were not manufactured by Sprague Electric at this time.

Rapid Growth of Television Following War Brings Increased Business In Components

In 1947, 250,000 television sets were manufactured and sold. It was an advanced new medium and there was much speculation in the industry as to the ultimate demand for the new product – and also its impact on the radio business. Many felt it might greatly reduce the demand for radios while others thought it unlikely that people would spend long hours in front of "the box".

The history of the 20-odd years to the present may well hold a lesson for us all. The new product, television, did not diminish the demand for radio, but it did provide an important means for the electronics industry to grow beyond any previous expectations. As the television industry was beginning to develop, radio was being improved and expanded. The first cumbersome sets gave way to smaller, more compact, and even portable models. This advancement was due primarily to the improved components provided by the electronics industry.

HIGH QUALITY NEEDED

A television set uses from five to six times as many capacitors as an average radio, and in addition has higher operating temperatures and more severe electrical requirements. Consequently higher quality capacitors are needed. In 1947 Sprague Electric was one of the very few companies in the industry having the engineering techniques and equipment necessary to produce capacitors of the type necessary for television sets. The then new molded tubular units were an important solution to the television industry's need. In addition, Sprague Electric had developed a new high temperature electrolytic capacitor, high voltage resistors, and resistors with special windings called "noninductive". Sprague KOOLOHM and SPIRAMEG resistors were also used in many popular television receivers.

The Sprague policy of large expenditures for research and development put the Company in the lead following the War. Many products developed for the military found ready peacetime application. The Electronic Age was to bring the most rapid product advancement ever witnessed in the history of mankind.

Sprague Products, First Wholly-Owned Subsidiary, Acquired in June 1946

In 1946 Sprague Electric Company acquired its first wholly-owned subsidiary, the Sprague Products Company. Organized by Harry Kalker in 1933, Sprague Products handled the sale of Sprague Electric components to distributors for replacement purposes.

As one of the original Sprague Electric salesmen, Mr. Kalker was well versed in the complete product line. Under his able supervision the needs of the radio, and later television, repair shops were well supplied with attractively packaged and proper capacity units.

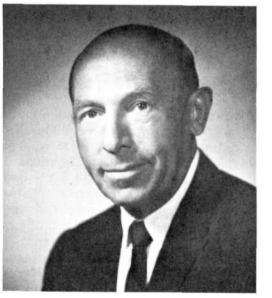
A COMPLETE SERVICE

Mr. Kalker traveled extensively, visiting 'jobbers, familiarizing himself with their needs and meeting as many of the men as possible. He also distributed attractive bulletins for the repair trade and often sent along informative news letters describing new applications for Sprague units.

In addition to the components themselves, Sprague Products supplied attractive display cases which further aided in making the Sprague name a familiar one. As with the radio manufacturers, themselves, quality of product was stressed to the replacement trade. Our competition would often supply a cheaper unit, but its quality would be of questionable value. With Sprague, quality was of utmost importance.

The Sprague Products Company has continued to grow and expand over the past thirty-some years. Three Sprague Product sales offices are now located strategically across the country and about thirty sales representatives handle the extensive accounts. Mr. Kalker dates his association with Sprague Electric to the early days of 1926 and is still very much on the job as President of Sprague Products.

A strong support organization, Sprague Products has contributed to the demand for Sprague Electric units and Sprague Electric's consistent growth and development has further enhanced the increased sales of Sprague Products. It has proven to be a mutually advantageous combination.



Harry Kalker

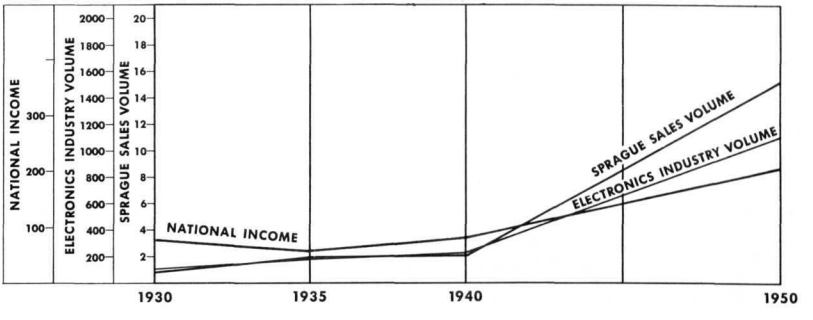
Sprague Employes Assist Children In War Ravaged Holland

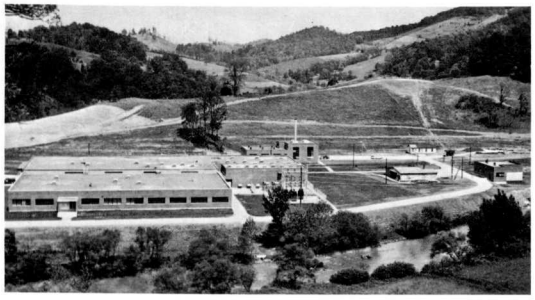
Following the War, children in many European countries were in dire need. It seemed fitting that Sprague employes should do whatever they could to assist at least some of them, and arrangements were made to sponsor a group of children in Holland. These unfortunate tykes had very little food or clothing and their school had been destroyed.

An appeal to Sprague employes for donations brought over two hundred dollars in two weeks. In addition to money, usable clothing was also collected and sent on its way. Soon letters began to pour in from the grateful children. Their English was limited but their thanks was not.

The donations continued for a long time, and the Marshall Street yard was later brightened with beautiful tulips, sent to North Adams by the children of Holland. During those years the LOG often carried pictures and stories about the children and their progress. It had been a heartwarming experience for all concerned.

SPRAGUE LEADS THE INDUSTRY





The location of the Ashe County, North Carolina Plant has proven to be a wise choice. Situated in the northwest corner of the state in the Blue Ridge Mountains, the plant is staffed by industrious, hard working local people.

Production of Dry Electrolytic Capacitors Was Expanded to North Carolina in 1953

In 1953 construction was started on a new manufacturing plant in Ashe County, North Carolina. The new operation, which was built from the ground up, was completed in 1954 and opened for the production of dry electrolytic capacitors.

Growth of the television business produced a heavy demand for this product and in 1955 an addition was built to substantially increase the manufacturing area. Subsequent additions have provided for employment of about 1,000.

Dry aluminum electrolytics were one of the early Sprague product lines and are still in great demand today. Many of the newer, miniature types are used in business machines, electronic-control applications and entertainment electronics. They are also used extensively in radios, television sets, air conditioners, refrigerators, computers, and an ever increasing variety of military electronic equipment.

Presently dry electrolytics are manufactured in North Adams and Hillsville, Virginia in addition to the North Carolina operation. Dry electrolytic capacitors, as the name implies, are manufactured with aluminum foil which has been formed by an electrolytic process which deposits an aluminum oxide film on the foil. In order to further increase the capacity, the foil is first etched to increase its surface area. The use of this etched and formed foil makes possible the manufacture of dry electrolytic capacitors which have capacities many times that of paper capacitors of the same direct current voltage rating in the identical sized container.

Dry electrolytics are a product line which have remained in demand for a long period of time and it is expected the demand will continue for the forseeable future.

New Product

Continued from page 1

literally fell in on the business, and as the books were closed for the year a net loss of staggering proportions was posted. It was also the first year in which sales exceeded the million dollar mark, but the informal management controls being exercised at the time were not adequate for a business operation.

A study of research-based companies in New England showed most of them were created by people of scientific and technical, rather than general business background. This was true of the Sprague Company in its early years. With the reverses of 1931 a management consulting firm was employed to reorganize the operating and accounting functions as well as plant layout and employe compensation.

The next few years were agonizing, but the job of saving the young Company was accomplished. In addition the whole Nation was in the midst of the worst depression ever experienced. As we look back almost forty years later, we were fortunate, indeed, to have survived. The penalties of the rigid financial curtailment, which among other things completely eliminated research and engineering expenditures, were to plague the Company for many years.

From a patentable idea to a product on the market is a matter of years. First there is the time required to work out the idea and perfect the model in the laboratory. Then follows the time needed to devise the most efficient and economical manufacturing methods and machines. And finally there is a brief period of high profits in the marketplace before competitors find ways of circumventing the originator's monopoly. Here at Sprague Electric the laboratory period averages around two years, the lab to production period a year or so, and the high profit period from three to five years.

We have briefly scanned the very early years of our Company - how it progressed, developed and grew will be detailed on the following pages. From the Tone Control to today's vast organization is a fascinating story - what most of us like to consider the typical American success story. We hope you will enjoy learning about your Company.

Introduction of Transistor Opens Vast New Opportunities To Component Producer

The introduction of the transistor opened vast new possibilities to the component manufacturer. In early 1952 Sprague Electric concluded a licensing agreement with Western Electric Company and started an active research and development program for the new device.

The program, which was one of the largest ever undertaken by the Company up to that time, originally emphasized development of a fused-junction germanium transistor capable of highly efficient operation. Pilot manufacturing operations were later established in North Adams for several devices designed by Sprague Electric personnel.

PHILCO AGREEMENT

In 1955, through an agreement with Philco Corporation, Sprague Electric was licensed to manufacture transistors by the surface-barrier process developed by Philco. The agreement also provided that the two companies exchange research and development data, as well as production and testing techniques covering the entire field of semiconductors.

The Sprague-Philco agreement was of special significance to the electronics industry in that it provided two independent manufacturing sources for an identical high-frequency transistor. Heretofore, transistorized equipment of all types had to be designed around transistors of a particular supplier, and transistors manufactured by other companies could not be readily interchanged with, or used to replace, those of the original design.

MARKET GREW RAPIDLY

Industry-wide the transistor market grew rapidly. Between 1955 and 1956 the sales more than tripled from 3.6 million units to 12.8 million. Many radios, both portable and automobile, were transistor built and virtually all computers used transistors. Other industrial equipment manufacturers were quick to realize the potential of the new product.

Sprague Electric did not attempt to cover the entire transistor field but specialized initially in high-frequency transistors used in computers and military equipment. Each year produced further strengthening of the product line and an increased demand.

CONCORD PLANT

With the growth of the transistor business new space for a large manufacturing plant was needed. Concord, New Hampshire was chosen as the sight and the new plant was started in 1956. It was opened early in 1957 and fully equipped and in operation by midyear. Additions to the original structure have quadrupled the manufacturing space.

Because of the growing importance of the transistor business and the specialized nature of its engineering, production and marketing problems, all areas were combined under unified management and control in 1960 as the Transistor Division with headquarters in Concord. In 1964, the Transistor Division became the Semiconductor Division to better delineate the Company's increased activities.

Sprague Granted Basic Patents For Solid Tantalum Units

In addition to the intensive work being done in transistors, Sprague Electric was awarded basic patents for new solid tantalum units which were to prove to be an exceptionally popular product.

Originally introduced in 1956, solid tantalums were manufactured at Concord, New Hampshire and later expanded to Plymouth, New Hampshire and Sanford, Maine. They were particularly in demand for computers and also airborne electronics. Their extremely small size and stable electrical characteristics were outstanding advantages when used in conjunction with transistors for military electronic equipment.

During the same period, resistor production was being increased with the addition of several new lines including improved KOOLOHM resistors and the new BLUE JACKET vitreous enamel models and FILMISTOR carbon film units. Resistor production was housed at Nashua, New Hampshire.

The girls in the foreground attach tiny germanium blanks to transistor stems mounted in precision-machined jigs. The dies then pass through the various steps in the "precision-etch" process of manufacturing transistors on the machine and emerge at the far end as completed transistor elements ready for attachment of whiskers, capping, and final test.

Growing After 40 Years— Continued from page 1

this – as the individual prospers so does the company! Or we might phrase it in the reverse – as the company prospers so does the individual.

A profitable company provides employment with good wages. It encourages its people to learn more, to upgrade themselves to higher paying positions, and it provides opportunity for those who are anxious to better themselves.

Conversely, an employe anxious to learn new skills finds that many opportunities are open to him. His superiors are anxious to provide for education which will make him more valuable on the job. The employe is thus in a position to earn more for himself and the company.

In a business which is not successful there is no money for improvement, either individual or corporate. Lending institutions will not finance borrowing because the company is a poor risk. There is no assurance the money will be returned.

The Profit Motive

This brings us to another most important point. The direction of any enterprise, corporate or individual, requires decision-making. Speaking at the Worcester Junior College Commencement exercises in June 1965, Robert C. Sprague, Chairman of the Board and Chief Executive Officer, said, "The profit motive is actually a short way of describing a system which permits, encourages and requires *individual decision making* in the conduct of business and personal affairs." Since Sprague Electric was founded in 1926, many thousands of individual decisions have been made by all members of the Sprague team.

The profit which a company earns is a reliable barometer of how successful the decisions have been. It can be traced back to the work performed by each and every employe. Any decision to not do the best job possible jeopardizes the product being manufactured and the company as a whole. Customers will make a decision not to buy a product which is of poor quality.

Sprague Electric is a successful company and it is successful because many hundreds of people have each done their job to the best of their ability. The Company has grown and its employes have grown with it. It has been a profitable venture for both.

photo by Gardner Roberts

A recent aerial photograph of the large addition to the Sanford, Maine plant shows work progressing rapidly. The new area will house expanded solid tantalum and ceramic Monolythic production.

photo by Sydney M. Kanter

The new Worcester, Massachusetts Semiconductor Plant is a showplace of the most modern design and manufacturing capability. Original plans allow for future expansion to further increase the production potential. When completely operational the facility will be opened for inspection by customers, interested industry representatives, and employes and their families.

SPRAGUE LOG

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Three Important Groups Coordinate Plans For Growth And Expansion

In 1959 Sprague Electric's sales surpassed $50,000,000 for the first time. It was at this point that the Fourth Decade Committee was formed. The Committee's initial goals included the establishment of reasonable targets for the Company through 1967, the end of the fourth decade.

For its first three decades Sprague Electric's sales and profits had increased at a compound rate of 16% annually. In those first thirty years such growth rates were achieved comfortably and without undue strain, even though they far surpassed the industry generally. But it was clear that to maintain such growth rates through the fourth decade would overtax the Company's financial and manpower resources. Consequently, one of the Fourth Decade Committee's original decisions represented a sort of compromise; for the period from 1958 through 1967, it projected a corporate growth rate of 12% annually. In the first half of the decade this target was substantially exceeded; in 1963 and 1964 we did not do as well, but present indications are that the target will be more than reached.

PRODUCT COMMITTEES

Since its formation the Fourth Decade Committee has worked closely with Product Committees. These Committees represent virtually all product categories and are composed of three members each. Each chairman is responsible for all operating and planning functions as they relate to his product area. He determines the inputs to meet immediate sales needs; he guides engineering and manufacturing activities to meet future needs. His tools range from detailed, constantly revised sales-and-production estimates to a heavy reliance on Value Engineering groups. Since the Product Committees cover the entire Sprague product line, they serve as a clearing house and a filter for much valuable information.

VALUE ENGINEERING

One of the most vital factors to be taken into account in long-range planning is manufacturing cost reduction. Value Engineering was organized as a systematic approach to reducing the cost of a manufacturing function without impairing the quality of the product.

The Value Engineering groups are made up of representatives of manufacturing, engineering, purchasing and methods and they meet regularly to study each step in the manufacture of the product for which they are responsible. Following each study, two plans are presented – one for immediate action and one for long-range changes.

Although the Value Engineering groups are a more recent formal technique than the Product Committee or the Fourth Decade Committee, they are destined to contribute substantially to the strong competitive posture of the Company.

The three-prong approach of Value Engineering, Product Committee and Fourth Decade Committee provides a firm footing on which to gauge further activities.

New Technology Predicted For Industry In 1970's

In the 1870's a leading inventor made the statement that the age of inventions was practically over since "everything worth inventing had already been produced". Today the statement seems ridiculous when we think of the tremendous advancements made since that time – and there will be more!

Robert C. Sprague, speaking to an American Management Association group in New York City in 1964, mentioned that by 1973 an entirely new electronics technology will have evolved. He called it "Technology X" and noted that it was not just a "blue sky" statement as there was already in process "a sophisticated means of reducing the size of electronic units which will revolutionize the design of military equipment."

The new, smaller units produced by these new processes, Mr. Sprague said, will at first be limited to defense use, but later will find their way into industrial and home products. This will be some time in coming due to the original heavy cost.

The electronics industry is interesting and challenging – both now and in the future!